

REMARKS

In the Office Action, Claims 5 and 12 are objected; Claims 2-9 and 12 are rejected under 35 U.S.C. §112, second paragraph; and Claims 2-9 and 12 are rejected under 35 U.S.C. §103. Claim 12 has been amended; and Claim 5 has been cancelled. Attached hereto is a marked-up version of the changes made to the claims by the current amendment. The marked-up version is captioned **“Versions with Markings to Show Changes Made.”** Applicants respectfully submit that the rejections have been overcome in view of the amendments and for the reasons set forth below.

In the Office Action, claims 5 and 12 have been objected; and claims 2-9 and 12 have been rejected under 35 U.S.C. § 112, second paragraph. As previously discussed, claim 12 has been amended; and claim 5 has been cancelled. In view of same, Applicants believe this should address the issues raised by the Patent Office with respect to the claim objections and rejections under 35 U.S.C. § 112. Applicants note for the record that the amendments in response to same have been made for clarification purposes and thus do not have a narrowing effect on the scope of the claimed subject matter. Applicants further note that they do not intend to disclaim any claimed subject matter via the amendment.

Accordingly, Applicants believe that the claim objections and the rejection of claims 2-9 and 12 under 35 U.S.C. § 112 be withdrawn.

In the Office Action, claims 2-9 and 12 are rejected under 35 U.S.C. §103 as being unpatentable over EP0724305A1 (“*Akashi*”) in view of U.S. Patent No. 5,522,127 (“*Ozaki*”). The Examiner has primarily relied on *Akashi* and thus relies on *Ozaki* to remedy the deficiencies of *Akashi*.

Of the pending claims, claim 12 is the sole independent claim. Claim 12 recites a gel electrolyte secondary cell that includes a positive electrode, a negative electrode and a gel electrode. The negative electrode includes a current collector and a powder mixture including a graphitized carbonaceous material obtained from a plurality of meso-carbon micro-beads and a binder wherein the powder mixture is coated on the current collector at a thickness ranging from 10 micrometers to 200 micrometers. The gel electrolyte includes an electrolyte salt, a non-aqueous solvent at least including propylene carbonate in an amount ranging from 10 mol% to 75 mol%, ethylene carbonate and a high-molecular weight material having a number average molecular weight ranging from 5000 to 500,000.

Applicants have uniquely discovered that a gel electrolyte secondary cell which combines, for example, a negative electrode made from a current collector and coated with a negative electrode material including meso-carbon micro-beads and a gel electrolyte composed of a high molecular weight material effectively achieves a large discharge capacity and a high charging/discharging efficiency as compared to electro-chemical cells that employ typical non-aqueous electrolytes.

In contrast, Applicants believe the cited art fails to disclose or suggest a number of features of the claimed invention. At the outset, Applicants question how the Patent Office can even justify combining the teachings of the cited art in the first place. Clearly, *Akashi* relates to gel electrolyte secondary cells whereas *Ozaki* relates to non-aqueous electrolyte secondary cells.

Further, the cited art teaches away from the combinability of same. Indeed, the *Ozaki* reference disfavors the use of polyethylene carbonate, let alone its use with ethylene carbonate, as a non-aqueous solvent. The clear emphasis of *Akashi*, on the other hand, is to employ a non-aqueous solvent, such as polyethylene carbonate and ethylene carbonate, with a gelling agent to provide a fire-retardant gel electrolyte material. In view of same, Applicants believe that one skilled in the art clearly would not be motivated to combine the teachings of *Akashi* and *Ozaki*.

Even if combinable, the cited art still fall shorts with respect to disclosing or suggesting the claimed invention. As previously discussed, the claimed invention generally relates to a gel electrolyte secondary cells that combines a negative electrode made from meso-carbon micro-beads and a gel electrolyte. The gel electrolyte includes, in part, a high-molecular weight gelling agent and a non-aqueous solvent at least including propylene carbonate and ethylene carbonate. The inventors have discovered that the negative electrode made from meso-carbon micro-beads can enhance the discharge capacity and the charging/discharging efficiency of secondary cell as discussed above.

As even admitted by the Patent Office, the *Akashi* reference is deficient with respect to the negative electrode features of the claimed invention. Further, *Akashi* clearly fails to recognize the beneficial effects of using same. Indeed, the primary focus of *Akashi* relates to fire-retardant gel electrolyte materials as previously discussed.

While *Ozaki* purportedly discloses the use of mesophase graphitized particles as a negative electrode material, again, *Ozaki* relates to non-aqueous electrolyte secondary cells and not gel electrolyte secondary cells. Further, *Ozaki* does not suggest that its purported findings

can been applied to gel electrolyte cells. What the Patent Office clearly has done is to rely on "hindsight reasoning" to justify the rejection. Of course, this is clearly improper. Therefore, Applicants do not believe that one skilled in the art viewing *Ozaki* would be inclined to modify *Akashi* to arrive at the claimed invention.

Based on at least these noted differences between the cited art and the claimed invention, Applicants believe that the cited art fails to disclose or suggest a number of features of the claimed invention. Therefore, Applicants respectfully submit that the cited art, even if combinable, fails to render obvious the claimed invention. Accordingly, Applicants respectfully request that the obviousness rejection be withdrawn.

For the foregoing reasons, Applicants respectfully request reconsideration of the present application and earnestly solicit an early allowance of same.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Claims:

Claim 12 has been amended as follows:

12. (Three Times Amended) A gel electrolyte secondary cell comprising:

a positive electrode;

a negative electrode comprising a current collector and a powder mixture including a graphitized carbonaceous material obtained from a plurality of meso-carbon micro-beads and a binder, wherein the powder mixture is coated on the current collector at a thickness ranging from 10 μm to 200 μm ; and

a gel electrolyte comprising an electrolyte salt, a non-aqueous solvent ~~at least including propylene carbonate in an amount ranging from 10 mol% to 75 mol%, ethyle carbonate and a~~ high-molecular weight material having a number average molecular weight ranging from 5000 to 500000 wherein the non-aqueous solvent at least includes propylene carbonate in an amount ranging from 10 mol% to 75 mol% and ethylene carbonate.

Claim 5 has been cancelled without prejudice or disclaimer.